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EXAMINER	
AMIN, JWALANT B	
ART UNIT	**PAPER NUMBER**
2676	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/809,261	DRORY ET AL.	
	Examiner	Art Unit	
	Jwalant Amin	2676	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

2. In reference to claims 1, 4, 5, 7, and 8, the Applicant argues that Kronmiller fail to teach, "generating the attributes of the border tiles based on whether the designated edge of each border tile crosses the polygon, is within the polygon, or is outside the polygon" (see page 6, 4th paragraph of Applicant's remarks).

The examiner interprets that Baldwin in view of Kronmiller explicitly teaches:

The rasterizer unit classifies tiles that are inside, outside or intersect the edges of the primitive ([0104], [0111]; tiles inside, outside or intersecting the edges of the primitive corresponds to attributes of the border tile). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the rasterizer unit as taught by Baldwin into the method of Kronmiller to generate the attributes of the border tiles because this would classify the tiles into the tiles inside the primitive, tiles outside the primitive and tiles intersecting the primitive, so that no time is wasted in visiting tiles outside the primitive while building up the tile mask, and thus improving the processing time for computing the tile mask ([0104], [0111], [0119]).

3. In reference to claims 6, 9, 10, 12, 13 and 16-18, the Applicant argues that Kronmiller and Chui fail to teach, "This spatial relationship is one of: (1) the at least one segment crossing the edge, (2) the edge being located within the polygon, and (3) the edge being located outside the polygon".

The examiner interprets that Baldwin in view of Kronmiller explicitly teaches:

The rasterizer unit classifies tiles that are inside, outside or intersect the edges of the primitive ([0104], [0111]; tiles inside, outside or intersecting the edges of the primitive corresponds to attributes of the border tile; see the motivation of combining the knowledge of Baldwin into the method of Kronmiller as stated above in reference to claim 1).

4. Applicant's arguments, see page 8 last paragraph, filed on 12/26/2005, with respect to the rejection(s) of claim(s) 2, 3, 11, 14, 15, 19, and 20 under allowable subject matter have been fully considered but are moot in view of the new ground(s) of rejection.

5. In reference to claims 2 and 3, the combination of Kronmiller and Baldwin teach to generate a first attribute, a second attribute, and a third attribute different from each other (Baldwin [0104]; tiles inside, outside or intersecting the edges of the primitive corresponds to attributes of the border tile which are different from each other).

6. In reference to claim 11, the combination of Kronmiller and Baldwin teach to modify a first condition and set to a second condition if multiple segments pass through the same border tile (As shown in Fig. 20 of Kronmiller, the tile may have the attribute "intersecting or partially inside" as the first condition if it is intersecting the first polygon, then it's attribute may change to another condition "outside" if it is outside the second polygon, and further it's attribute may change to "intersecting or partially inside" as the third condition if it is intersecting the third polygon; the edges of the first and third polygon passes through the same tile). It would have been obvious to one of ordinary

skills in the art at the time the invention was made to use multiple polygons because it is well known in the art to represent complex scenes using multiple polygons for effective rendering of the scene.

7. In reference to claims 14 and 15, the combination of Kronmiller and Baldwin teach to generate an attribute of the border tile based on proximity of a segment through the y-axis and comparing proximities of two different segments through the y-axis (the tile may have the attribute set as "outside" if the segment of the first polygon is not in proximity to y-axis, but the attribute may be changed to "intersecting or partially inside" if the segment of the second polygon is in proximity to the y-axis of the tile by comparing the distance between the segments of the first and the second polygons since the distance of the segment of the second polygon will be less than the distance of the segment of the first polygon, and further the attribute of the tile may be changed to "inside" by comparing the distance between the segment of the second polygon and that of the third polygon; see the motivation of combining the knowledge of Baldwin into the method of Kronmiller as stated above in reference to claim 11).

8. In reference to claims 19 and 20, the combination of Kronmiller and Baldwin teach to identify a spatial relationship between a segment and the horizontal axis to define an attribute (the attribute of the tile is set to "intersecting or partially inside" if one segment of the first polygon crosses the horizontal axis of the border tile, and further the attribute is changed to "inside" if the segment of the second polygon is inside the tile; the segment of the second polygon does not cross the horizontal axis of the tile as it is

inside the tile; see the motivation of combining the knowledge of Baldwin into the method of Kronmiller as stated above in reference to claim 11).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1-12 and 14-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kronmiller et al. (US Patent No. 6,701,306; hereinafter referred to as Kronmiller) in view of Baldwin (US Pub. No. 2002/0118202).

11. Regarding claim 1, Kronmiller teaches a method for defining attributes of polygon border tiles, comprising decomposing a polygon into a plurality of segments (Fig. 2a, Fig. 9, col. 3 lines 56-60, col. 4 lines 33-37; col. 8 lines 36-39, geometric objects defined in a multi-dimensional space represented by data tuples or data segments/convex polygon for use as a data segment corresponds to a polygon; dividing the mutli-dimensional data space into a number of data regions corresponds to decomposing a polygon); decomposing the segments into a plurality of border tiles (Fig. 10, Fig. 11, col. 9 lines 31-38 and lines 61-62; dividing the IC layout into a number of tile regions corresponds to decomposing a segment into plurality of tiles); designating at least one edge for each border tile (Fig. 16, Fig. 22, Fig. 23; the lines of the rectangular tile correspond to the edges of the tile; designating all four edges of the tile or any one edge

of the tile corresponds to designating at least one edge for each border tile); determining a spatial relationship between the designated edge of each border tile and the polygon (col. 9 lines 62-67, col. 10 lines 1-4; tile region/tile data structure corresponds to border tile; each tile region corresponds to each border tile; all four edges or any edge of the tile corresponds to the designated edge of the tile; interconnect line/ interconnect segment corresponds to the polygon; storing the interconnect-line data into tile data structure and querying the data corresponds to determining spatial relationship).

Kronmiller discloses all of the claimed limitations as stated above, except that generating the attributes of the border tiles based on whether the designated edge of each border tile crosses the polygon, is within the polygon, or is outside the polygon. However, Baldwin teaches the rasterizer unit seeking out tiles that are inside, outside or intersect the edges of the primitive ([0104], [0111]; primitive corresponds to polygon; edges of the primitive corresponds to segments of the polygon; start tile corresponds to border tile or tile; tiles intersecting the edges of the primitive/tiles partially inside the primitive corresponds to border tile crossing the polygon; tiles inside the edges of the primitive corresponds to border tiles within the polygon; tiles outside the primitive corresponds to border tiles outside the polygon; tiles inside, outside or intersecting the edges of the primitive corresponds to attributes of the border tile; rasterizer seeks out tiles which are inside the edges or intersect the edges/prevent the rasterizer visiting tiles outside the primitive corresponds to generating the attributes of the border tiles based on whether the designated edge of each border tile crosses the polygon, is within the

polygon, or is outside the polygon). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the rasterizer unit as taught by Baldwin into the method of Kronmiller to generate the attributes of the border tiles because this would classify the tiles into the tiles inside the primitive, tiles outside the primitive and tiles intersecting the primitive, so that no time is wasted in visiting tiles outside the primitive while building up the tile mask, and thus improving the processing time for computing the tile mask ([0104], [0111], [0119]).

12. Regarding claims 2 and 3, Kronmiller discloses all of the claimed limitations as stated above, except that generating the attributes comprises generating a first attribute if the designated edge of the border tile crosses the polygon; generating a second attribute if the designated edge of the border tile is disposed completely within the polygon; generating a third attribute if the designated edge of the border tile is disposed completely outside the polygon; and where the first, second, and third attributes are different from each other. However, Baldwin teaches the rasterizer unit seeking out tiles that are inside, outside or intersect the edges of the primitive ([0104], [0111]; primitive corresponds to polygon; edges of the primitive corresponds to segments of the polygon; start tile corresponds to border tile or tile; tile intersecting the edges of the primitive/tile partially inside the primitive corresponds to first attribute of the border tile; tile inside the edges of the primitive corresponds to second attribute of the border tile; tile outside the primitive corresponds to third attribute of the border tile; tiles inside, outside or intersecting the edges of the primitive corresponds to first, second and third attributes of the border tiles which are different from each other; rasterizer seeks out tiles which are

inside the edges or intersect the edges/prevent the rasterizer visiting tiles outside the primitive corresponds to generating the attributes of the border tiles based on whether the designated edge of each border tile crosses the polygon, is within the polygon, or is outside the polygon). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the rasterizer unit as taught by Baldwin into the method of Kronmiller to generate the different attributes of the border tiles because this would classify the tiles into the tiles inside the primitive, tiles outside the primitive and tiles intersecting the primitive, so that no time is wasted in visiting tiles outside the primitive while building up the tile mask, and thus improving the processing time for computing the tile mask ([0104], [0111], [0119]).

13. Regarding claim 4, Kronmiller teaches designating at least one edge for each border tile further comprises designating an eastern edge for each border tile (Fig. 16, Fig. 22, Fig. 23; the lines of the rectangular tile correspond to the edges of the tile, the right edge corresponds to the eastern edge; designating all four edges of the tile corresponds to designating an eastern edge for each border tile).

14. Regarding claim 5, Kronmiller teaches designating at least one edge for each border tile further comprises designating the same edge for each of the plurality of border tiles (Fig. 10, Fig. 11, Fig. 16, Fig. 22, Fig. 23; col. 9 lines 37-38 and lines 61-67, number of tile regions corresponds to plurality of tiles, and the lines of the rectangular tile correspond to the edges of the tile; designating all four edges of the tile corresponds to designating the same edge for each of the plurality of border tiles).

15. Regarding claim 6, Kronmiller discloses all of the claimed limitations as stated above, except that determining if the designated edge of a border tile is within an interior space of the polygon. However, Baldwin teaches to classify tiles as inside, outside or intersecting the edges of the primitive ([0104]; primitive corresponds to polygon; edges of the primitive corresponds to segments of the polygon; start tile/tile corresponds to border tile; all of edges of the tile corresponds to designated edges of a border tile; totally inside the primitive corresponds to interior space of the polygon; tiles which pass this stage ... inside the primitive corresponds to determining if the designated edge of a border tile is within an interior space of the polygon). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the rasterizer unit as taught by Baldwin into the method of Kronmiller to determine if the border tile is inside the polygon because tiles which are totally inside the primitive are automatically marked with 100% coverage so these are processed at non antialiasing speeds, resulting in a faster processing path for fully covered pixels ([0116] last five lines).

16. Regarding claim 7, Kronmiller teaches designating the segments as vectors that traverse in a clockwise direction around a border of the polygon (col. 7 lines 32-48; the vector P1->P0 corresponds to segment traversing in clockwise direction); and determining an attribute of a border tile based on a proximity of one of the vectors to one of the edges of a border tile and based on a direction of the one of the vectors through the border tile (col. 7 lines 49-57; outside and inside corresponds to the attributes of the tile; defining a half plane corresponds to the direction of the vector; the

Nth edge ... of the polygon corresponds to proximity of one of the vectors to one of the edges of a border tile).

17. Regarding claim 8, Kronmiller teaches decomposing multiple segments through a single border tile (Fig. 22, col. 9 lines 61-67, col. 10 lines 1-2, number of tile regions corresponds to plurality of tiles; the lines of the rectangular tile correspond to the edges of the tile; Fig. 22 shows two segments of a polygon decomposed through a single tile).

18. Regarding claim 9, Kronmiller teaches a computer-readable medium having computer-readable program code (col. 21 lines 9-13); defining a polygon having a border that is non-self-intersecting (Fig. 2, col. 4 lines 23-32; convex polygon corresponds to non-self-intersecting polygon), and formed of a plurality of segments on a grid of tiles (Fig. 13, col. 9 lines 61-62, col. 10 lines 55-57; rectangular tiles correspond to grid of tiles; IC layout corresponds to the polygon segments); defining from the grid of tiles, a plurality of border tiles that intersect the segments (col. 9 lines 61-62, number of tile regions corresponds to plurality of tiles, IC layout corresponds to the polygon segments; the process divides ... into a number of tiles corresponds to defining from the grid of tiles, a plurality of border tiles that intersect the segments).

Kronmiller discloses all of the claimed limitations as stated above, except that generating an attribute associated with at least one edge of a border tile, wherein the attribute is selected from the group consisting of: the at least one edge crossing a segment, the at least one edge disposed completely within the polygon, and the at least one edge disposed completely outside the polygon. However, Baldwin teaches the rasterizer unit seeking out tiles that are inside, outside or intersect the edges of the

primitive ([0104], [0111]; primitive corresponds to polygon; edges of the primitive corresponds to segments of the polygon; start tile/tile corresponds to border tile/tile; tiles intersecting the edges of the primitive/tiles partially inside the primitive corresponds to the at least one edge crossing a segment; tiles inside the edges of the primitive corresponds to the at least one edge disposed completely within the polygon; tiles outside the primitive corresponds to the at least one edge disposed completely outside the polygon; tiles inside, outside or intersecting the edges of the primitive corresponds to attributes of the border tile; tiles inside, outside or intersecting the edges of the primitive corresponds to attributes of the border tiles which are different from each other; all four edges of the tile corresponds to at least one edge of a border tile; rasterizer seeks out tiles which are inside the edges or intersect the edges/prevent the rasterizer visiting tiles outside the primitive corresponds to generating an attribute associated with at least one edge of a border tile, wherein the attribute is selected from the group consisting of: the at least one edge crossing a segment, the at least one edge disposed completely within the polygon, and the at least one edge disposed completely outside the polygon). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the rasterizer unit as taught by Baldwin into the method of Kronmiller to generate the attributes of the border tiles because this would classify the tiles into the tiles inside the primitive, tiles outside the primitive and tiles intersecting the primitive, so that no time is wasted in visiting tiles outside the primitive while building up the tile mask, and thus improving the processing time for computing the tile mask ([0104], [0111], [0119]).

19. Regarding claim 10, Kronmiller teaches a tile with multiple polygons inside, outside or intersecting the tile (Fig. 20; 1830, 1835 and 1840 corresponds to multiple polygons; 1805 corresponds to the border tile).

Kronmiller discloses all of the claimed limitations as stated above, except that the attribute can be modified on at least two different occasions for the same border tile. However, Baldwin teaches to classify the each tile as inside, outside or crossing the primitive ([0104], [0108] lines 9-10; primitive corresponds to polygon; edges of the primitive corresponds to segments of the polygon; start tile/tile corresponds to border tile/tile; tiles inside, outside or intersecting the edges of the primitive corresponds to attributes of the border tile; each tile will be visited multiple times corresponds to the attribute of a tile can be modified multiple times based on whether the tile is inside, outside or intersecting the primitives; e.g. As shown in Fig. 20 of Kronmiller, the tile may have the attribute "outside" if it is outside the first polygon, then it's attribute may change to "intersecting or partially inside" if it is intersecting the second polygon, and further it's attribute may change to "inside" if it is totally inside the third polygon). Therefore, it would have been obvious to one of ordinary skills in the art at the time the invention was made to use multiple polygons as taught by Kronmiller for classifying and modifying the attribute of the tile as taught by Baldwin because it is well known in the art to use multiple polygons to represent complex scenes for effective rendering of the scene which makes it necessary to update the attribute of the tile based on it's spatial relationship with respective polygons.

20. Regarding claim 11, Kronmiller teaches a tile with multiple polygons inside, outside or intersecting the tile, and multiple segments passing through the same border tile (Fig. 20; 1830, 1835 and 1840 corresponds to multiple polygons; 1805 corresponds to the border tile; Fig. 20 shows that segment of polygon 1835 and 1840 pass through the same tile).

Kronmiller discloses all of the claimed limitations as stated above, except that the attribute is set to a first condition and then re-evaluated and set to a second condition if multiple segments pass through the same border tile. However, Baldwin teaches to classify the each tile as inside, outside or crossing the primitive ([0104], [0108] lines 9-10; primitive corresponds to polygon; edges of the primitive corresponds to segments of the polygon; start tile/tile corresponds to border tile/tile; tiles inside, outside or intersecting the edges of the primitive corresponds to attributes of the border tile; each tile will be visited multiple times corresponds to the attribute of a tile can be modified multiple times based on whether the tile is inside, outside or intersecting the primitives; e.g. As shown in Fig. 20 of Kronmiller, the tile may have the attribute "intersecting or partially inside" as the first condition if it is intersecting the first polygon, then it's attribute may change to another condition "outside" if it is outside the second polygon, and further it's attribute may change to "intersecting or partially inside" as the third condition if it is intersecting the third polygon; the edges of the first and third polygon passes through the same tile). Therefore, it would have been obvious to one of ordinary skills in the art at the time the invention was made to use multiple polygons as taught by Kronmiller for classifying and re-evaluating the attribute of the tile as taught by Baldwin

because it is well known in the art to use multiple polygons to represent complex scenes for effective rendering of the scene which makes it necessary to re-evaluate and update the attribute of the tile based on it's spatial relationship with respective polygons.

21. Regarding claim 12, Kronmiller further teaches that the attribute is associated with an eastern edge of the border tile (Fig. 22, the right edge corresponds to the eastern edge; attribute is associated with all four edges of the tile corresponds to attribute is associated with an eastern edge of the border tile).

22. Regarding claim 14, Kronmiller teaches a computer readable program code causing the computer system to perform (col. 21 lines 9-13; plurality of instructions corresponds to computer-readable program code) defining a y-axis through a border tile (col. 9 lines 61-62; IC layout corresponds to polygon segments; number of tile regions corresponds to plurality of tiles; tile regions along y-axes corresponds to defining a y-axis through a border tile).

Kronmiller discloses all of the claimed limitations as stated above, except that generating an attribute based on proximity of a segment through the y-axis. However Baldwin teaches to classify the each tile as inside, outside or crossing the primitive ([0104]; primitive corresponds to polygon; edges of the primitive corresponds to segments of the polygon; start tile/tile corresponds to border tile/tile; tiles inside, outside or intersecting the edges of the primitive corresponds to attributes of the border tile; e.g. if one vertical edge of the tile is the y-axis then if the attribute of the tile can be defined based on whether segment lies totally inside, partially inside or outside the y-axis and the other vertical edge of the tile by calculating the distance of the segment with respect

to the y-axis; generating an attribute based on distance of the segment from the y-axis corresponds to generating an attribute based on proximity of a segment through the y-axis; segments not in proximity to y-axis would be outside opposite edge of the tile). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to classify the tile as taught by Baldwin into the method of Kronmiller to generate the attributes of the border tile because this would classify the tiles into the tiles inside the primitive, tiles outside the primitive and tiles intersecting the primitive, so that no time is wasted in visiting tiles outside the primitive while building up the tile mask, and thus improving the processing time for computing the tile mask ([0104], [0111], [0119]).

23. Regarding claim 15, Kronmiller teaches a tile with multiple polygons inside, outside or intersecting the tile (Fig. 20; 1830, 1835 and 1840 corresponds to multiple polygons; 1805 corresponds to the border tile).

Kronmiller discloses all of the claimed limitations as stated above, except that generating an attribute further comprises comparing proximities of two different segments through the y-axis. However Baldwin teaches to classify the each tile as inside, outside or crossing the primitive ([0104]; see claim 14 for rejection related to generating an attribute based on a proximity of a segment through the y-axis; the tile may have the attribute set as "outside" if the segment of the first polygon is not in proximity to y-axis, but the attribute may be changed to "intersecting or partially inside" if the segment of the second polygon is in proximity to the y-axis of the tile by comparing the distance between the segments of the first and the second polygons since the

distance of the segment of the second polygon will be less than the distance of the segment of the first polygon, and further the attribute of the tile may be changed to "inside" by comparing the distance between the segment of the second polygon and that of the third polygon). Therefore, it would have been obvious to one of ordinary skills in the art at the time the invention was made to use multiple polygons as taught by Kronmiller for classifying and re-evaluating the attribute of the tile as taught by Baldwin because it is well known in the art to use multiple polygons to represent complex scenes for effective rendering of the scene which makes it necessary to re-evaluate and update the attribute of the tile based on it's spatial relationship with respective polygons.

24. Regarding claim 16, Kronmiller teaches a computer system comprising a processor and memory having computer readable code executable by the processor (col. 2 lines 20-21, col. 19 lines 39-40, col. 21 line 12, processing in a computer corresponds to computer processor; smaller system memories corresponds to computer memory; executed by a computer corresponds to executable by the computer processor); decomposing a polygon into plural segments on a grid of tiles (Fig. 13, col. 9 lines 61-62, col. 10 lines 55-57; rectangular tiles correspond to grid of tiles; IC layout corresponds to the polygon segments); identifying a first border tile having an edge (Fig. 13; Fig. 13 shows a plurality of tiles with four edges; four edges of a tile corresponds to identifying a first border tile having an edge), the first border tile intersecting at least one of the segments (Fig. 22; Fig. 22 showing two segments of a polygon intersecting a tile corresponds to the first border tile intersecting at least one of the segments).

Kronmiller discloses all of the claimed limitations as stated above, except that identifying a spatial relationship between the edge and the polygon to define an attribute of the first border tile with respect to the polygon, the spatial relationship being one of the at least one segment crossing the edge, the edge being located within the polygon, and the edge being located outside the polygon. However, Baldwin teaches the rasterizer unit seeking out tiles that are inside, outside or intersect the edges of the primitive ([0104], [0111]; primitive corresponds to polygon; edges of the primitive corresponds to segments of the polygon; start tile/tile corresponds to border tile/tile; tiles intersecting the edges of the primitive/tiles partially inside the primitive corresponds to the at least one segment crossing the edge; tiles inside the edges of the primitive corresponds to the edge being located within the polygon; tiles outside the primitive corresponds to the edge being located outside the polygon; tiles inside, outside or intersecting the edges of the primitive corresponds to attributes of the border tile; tiles inside, outside or intersecting the edges of the primitive corresponds to spatial relationship between the edge and polygon to define an attribute; all four edges of the tile corresponds to at least one edge of a border tile; rasterizer seeks out tiles which are inside the edges or intersect the edges/prevent the rasterizer visiting tiles outside the primitive corresponds to identifying a spatial relationship between the edge and the polygon to define an attribute of the first border tile with respect to the polygon, the spatial relationship being one of the at least one segment crossing the edge, the edge being located within the polygon, and the edge being located outside the polygon). Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to use the rasterizer unit as taught by Baldwin into the method of Kronmiller to generate the attributes of the border tiles because this would classify the tiles into the tiles inside the primitive, tiles outside the primitive and tiles intersecting the primitive, so that no time is wasted in visiting tiles outside the primitive while building up the tile mask, and thus improving the processing time for computing the tile mask ([0104], [0111], [0119]).

25. Regarding claim 17, Kronmiller further teaches that the plural segments are non-self-intersecting (Fig. 2, col. 4 lines 23-32, convex polygon corresponds to non-self-intersecting polygon; the edges of the polygon corresponds to the plural segments of the polygon).

26. Regarding claim 18, Kronmiller further teaches to identify a spatial relationship between a direction of the at least one segment through the first border tile to define an attribute of the first border tile (col. 9 lines 24-28, lines 49-56 and lines 62-67, col. 10 lines 1-2; IC/IC layout corresponds to segments of the polygon; interconnect-line corresponds to segment of the polygon; organize data ... other than horizontal or vertical corresponds to direction of the segment; outside and inside of the tile corresponds to the attributes of the tile; source and non-source interconnect lines corresponds to spatial relationship; storing the interconnect-line data into tile data structure and querying the data corresponds to determining spatial relationship).

27. Regarding claim 19, Kronmiller teaches a computer readable code executable by the processor (col. 21 lines 9-13; plurality of instructions corresponds to computer-readable program code) for defining a horizontal axis through the first border tile (col. 9

lines 61-62; IC layout corresponds to polygon segments; number of tile regions corresponds to plurality of tiles; tile regions along x-axes corresponds to defining a horizontal axis through a border tile).

Kronmiller discloses all of the claimed limitations as stated above, except that identifying a spatial relationship between the at least one segment and the horizontal axis to define an attribute. However Baldwin teaches to classify the each tile as inside, outside or crossing the primitive ([0104]; primitive corresponds to polygon; edges of the primitive corresponds to segments of the polygon; start tile/tile corresponds to border tile/tile; tiles inside, outside or intersecting the edges of the primitive corresponds to attributes of the border tile; e.g. if one horizontal edge of the tile is the horizontal axis then if the attribute of the tile can be identified based on whether segment lies totally inside, partially inside or outside the horizontal axis and the opposite horizontal edge of the tile by calculating the distance of the segment with respect to the horizontal axis; calculating the distance of the segment to measure proximity from the horizontal axis corresponds to spatial relationship between the segment and the border tile; generating an attribute based on distance of the segment from the horizontal axis corresponds to identifying a spatial relationship between the segment and the horizontal axis to define an attribute; segments not in proximity to horizontal axis would be outside opposite edge of the tile). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to classify the tile as taught by Baldwin into the method of Kronmiller to generate the attributes of the border tile because this would classify the tiles into the tiles inside the primitive, tiles outside the primitive and tiles

intersecting the primitive, so that no time is wasted in visiting tiles outside the primitive while building up the tile mask, and thus improving the processing time for computing the tile mask ([0104], [0111], [0119]).

28. Regarding claim 20, Kronmiller teaches a tile with multiple polygons inside, outside or intersecting the tile (Fig. 20; 1830, 1835 and 1840 corresponds to multiple polygons; 1805 corresponds to the border tile).

Kronmiller discloses all of the claimed limitations as stated above, except that at least one segment crosses the horizontal axis to generate a first attribute and does not cross the horizontal axis to generate a second attribute different than the first attribute. However Baldwin teaches to classify each tile as inside, outside or crossing the primitive ([0104]; see claim 19 for rejection related to generating a first attribute based on spatial relationship of the horizontal axis and the border tile; e.g. the attribute of the tile is set to "intersecting or partially inside" if one segment of the first polygon crosses the horizontal axis of the border tile, and further the attribute is changed to "inside" if the segment of the second polygon is inside the tile; the segment of the second polygon does not cross the horizontal axis of the tile as it is inside the tile). Therefore, it would have been obvious to one of ordinary skills in the art at the time the invention was made to use multiple polygons as taught by Kronmiller for classifying and re-evaluating the attribute of the tile as taught by Baldwin because it is well known in the art to use multiple polygons to represent complex scenes for effective rendering of the scene which makes it necessary to re-evaluate and update the attribute of the tile based on it's spatial relationship with respective polygons.

29. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kronmiller and Baldwin, and further in view of Nishihara, Masahiro (JP Patent No. JP410240952; hereinafter referred to as Nishihara).

30. Regarding claim 13, Kronmiller teaches a computer readable program code causing the computer system (col. 21 lines 9-13; plurality of instructions corresponds to computer-readable program code) to define a polygon wherein at least one segment passes twice through the same border tile (Fig. 13, col. 10 lines 54-57; IC layout 1205 corresponds to polygon segment; number of rectangular tiles corresponds to plurality of tiles; Fig. 13 shows the left segment of IC layout passing twice through the same border tile located as row 2 column 1).

The combination of Kronmiller and Baldwin discloses all of the claimed limitations as stated above, except that the polygon is converted to a non-self-intersecting chain-code. However, Nishihara teaches to convert the self-crossing polygon to a polygon in a not self-crossing state (Abstract, Solution: last 3 lines; self-crossing corresponds to self-intersecting; not self-crossing corresponds to non-self-intersecting). Therefore, it would have been obvious to one of ordinary skills in the art at the time the invention was made to use the conversion method as taught by Nishihara into the computer medium of Kronmiller and Baldwin to convert the polygon into a non-self-intersecting polygon because this would speedily execute the paint-out processing of a polygon (Abstract, Problem to be Solved: 2nd line).

31. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jwalant Amin whose telephone number is 571-272-2455. The examiner can normally be reached on Monday - Friday 9:30 a.m. - 6:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on 571-272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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*** J.A.
2/27/2006

ULKA CHAUHAN
SUPERVISORY PATENT EXAMINER